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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/692,584	10/24/2003	Mukerrem Cakmak	089-498-0447	9481
36905 7590 08/19/2009 ROETZEL AND ANDRESS 222 SOUTH MAIN STREET AKRON, OH 44308				
EXAMINER				
LET, RIP A				
ART UNIT		PAPER NUMBER		
1796				
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08/19/2009		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/692,584

Applicant(s)

CAKMAK ET AL.

Examiner

RIP A. LEE

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-946)
- 3) ☐ Information Disclosure Statement(s) (PTO/SE/US)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 26, 2009 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 11-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for controlling strain hardening in poly(lactic acid), PLA, by incorporation of montmorillonite clay, does not reasonably provide enablement for controlling strain hardening in all polymer and nanoparticles by the specific steps outlined in claims.

Working examples clearly describe strain hardening in montmorillonite/PLA compositions. Strain hardening phenomenon is realized since clay sheets act as infinitely long stiff chains which are oriented in the direction of deformation. Due to rigidity, clay sheets can not relax as polymer chains do, and they hold their orientation during deformation. Polymer chains which are entangled on and around clay sheets will not be allowed to relax, and polymer chains that have hydrogen bonding interaction with the clay sheets will also orient in the direction of deformation without relaxing. See specification, page 10, lines 19-25.

It is apparent that clay morphology and PLA structure, which may participate in hydrogen bonding with clay surface, are primary contributors to the observed strain hardening. However, the specification does not provide sufficient guidance that such strain hardening would be reproduced with all types of nanoparticle such as those in the form of spheres, sheets, foils,

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fibers, wires, tubes, or particles having irregular geometry (as recited in instant claims 13). Moreover, the specification is devoid of exemplary disclosure showing that strain hardening may be controlled using carbon nanoparticles, graphite nanoparticles, carbon nanotubes, graphite nanotubes, spherical nanoparticles, Buckyballs, glassy nanoparticles, silica-based nanoparticles, metal oxide nanoparticles, metal sulfide nanoparticles, metal nitride nanoparticles, metal complex nanoparticles, metal nanoparticles, metallic alloy nanoparticles, metallic alloy nanowires, metallic alloy nanospheres, metallic alloy nanosized sheets, metallic alloy foils, and colloidal nanoparticles (as recited in instant claims 14). Furthermore, the specification does not provide disclosure showing that strain hardening is controlled with the broad array of nanoparticles with all forms of polyolefin, polyamide, polyimide, polyester, aliphatic polymer, amorphous polymer, crystallizing polymer, blends, and alloys thereof (as recited in instant claims 12).

Based on these considerations, it is deemed that the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. Dependent claims are subsumed under the rejection.

4. Claims 11-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claim 11 recites a process in which the steps of quenching the polymeric composition and the step of forming the film are interchangeable. The relevant portion of the specification may be located on page 6, lines 5-16; indication of interchangeability of quenching and film forming steps could not be found in the written description. Dependent claims 12-20 are subsumed under the rejection.

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Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claim 20 is rejected under 35 U.S.C. 102(a) as being anticipated by Yamada *et al.* (JP 2002-363393).

Yamada *et al.* teaches a strain hardened composition comprising poly(lactic acid) and 0.2 to 20 parts of sheet silicate such as montmorillonite ; see paragraphs [0009], [0013], [0014], [0015], examples and Figure 1.

Present claim 20 is drawn to a strain hardened polymer product which is defined in product-by-process format. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayahsi *et al.* (U.S. 6,139,948) in view of Okabe *et al.* (U.S. 4,725,472).

The discussion of disclosure of references from paragraph 2 of the final office action dated December 26, 2008 is incorporated here by reference.

Kobayashi *et al.* is silent regarding the strain hardening phenomenon, however, in light of the fact the process described in the prior art is substantially similar, and in view of the fact that Kobayashi *et al.* teaches biaxial stretching of the product in order to obtain a film with excellent mechanical strength and durability, it would have been obvious to one having ordinary skill in the art that polyester film undergoes the claimed strain hardening. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Present claim 20 is drawn to a strain hardened polymer product which is defined in product-by-process format. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

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10. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Qian *et al.* (U.S. 6,407,155) in view of Haruta *et al.* (U.S. 3,773,609) or Ishibashi *et al.* (U.S. 5,180,626).

The discussion of disclosure of references from paragraph 3 of the final office action dated December 26, 2008 is incorporated here by reference.

Both primary and secondary references are silent regarding the strain hardening phenomenon, however, in light of the fact the process described in the prior art is substantially similar, it would have been obvious to one having ordinary skill in the art that polyester film undergoes the claimed strain hardening. Since the PTO can not perform experiments, the burden is shifted to the Applicants to establish an unobviousness difference. *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Present claim 20 is drawn to a strain hardened polymer product which is defined in product-by-process format. It is well settled that where product by process claims are rejected over a prior art product that appears to be the same, the burden is shifted to the Applicant to establish an unobviousness difference, even if the production processes are different. *In re Marosi*, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Furthermore, the patentability of a product claim rests on the product formed, not on the method by which it was produced. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Response to Arguments

11. The rejection of claims 11-19 over Kobayahsi *et al.* (U.S. 6,139,948) in view of Okabe *et al.* (U.S. 4,725,472) and the rejection of claims 11-19 over Qian *et al.* (U.S. 6,407,155) in view of Haruta *et al.* (U.S. 3,773,609)/Ishibashi *et al.* (U.S. 5,180,626), set forth in the final office action dated December 26, 2008, have been withdrawn. References do not teach specifically a process of subjecting film to strain hardening in a rubbery state by stretching the film at a temperature between the glass transition temperature and the cold crystallization temperature.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (571)273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

/Rip A. Lee/
Examiner, Art Unit 1796

August 16, 2009